

INITIAL SITE EVALUATION REPORT
FISHER-CALO CHEMICAL & SOLVENTS
KINGSBURY, INDIANA
JUNE 1985

R E M II

**PERFORMANCE OF REMEDIAL RESPONSE
ACTIVITIES AT UNCONTROLLED
HAZARDOUS WASTE SITES**

U.S. EPA CONTRACT NO. 68-01-6939

**CAMP DRESSER & MCKEE INC.
PRIME CONTRACTOR**

EPA Region 5 Records Ctr.



229505

CDM

environmental engineers, scientists,
planners, & management consultants

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27 June 1985

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Project: REM II - EPA Contract No. 68-01-6939
Work Assignment No: 64-5L13.0
Document No: 209-WP1-EP-BESE-1
Subject: Initial Site Evaluation Report
Fisher-Calo, Kingsbury, Indiana

Dear Messrs. Vanderlaan and Favero:

Camp Dresser & McKee is pleased to submit this Initial Site Evaluation Report for the Fisher-Calo site located near Kingsbury, Indiana.

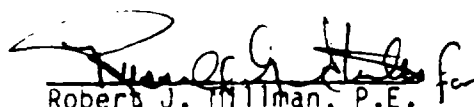
This report summarizes the existing setting of the site including a chronological history of the site and a compilation of base maps. The report also presents a summary of data shortfalls and the data needs to be addressed in the RI.

If you have any questions or comments, please contact me.

Very truly yours,

CAMP DRESSER & McKEE INC.


John W. Hawthorne, P.E.
Region V Manager


Robert J. Millman, P.E.
Site Manager

cc: U. A. Joiner, Contracting Officer, USEPA
W. M. Kaschak, Project Officer, USEPA
N. M. Willis, Regional Coordinator, USEPA

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LIST OF ACRONYMS

WQC = Water Quality Criteria
IDLH = Immediately Dangerous to Life and Health
NIOSH = National Institute of Occupational Safety & Health
PDWR = Primary Drinking Water Regulations
STEL = Short-Term Exposure Limit

1.0 INTRODUCTION

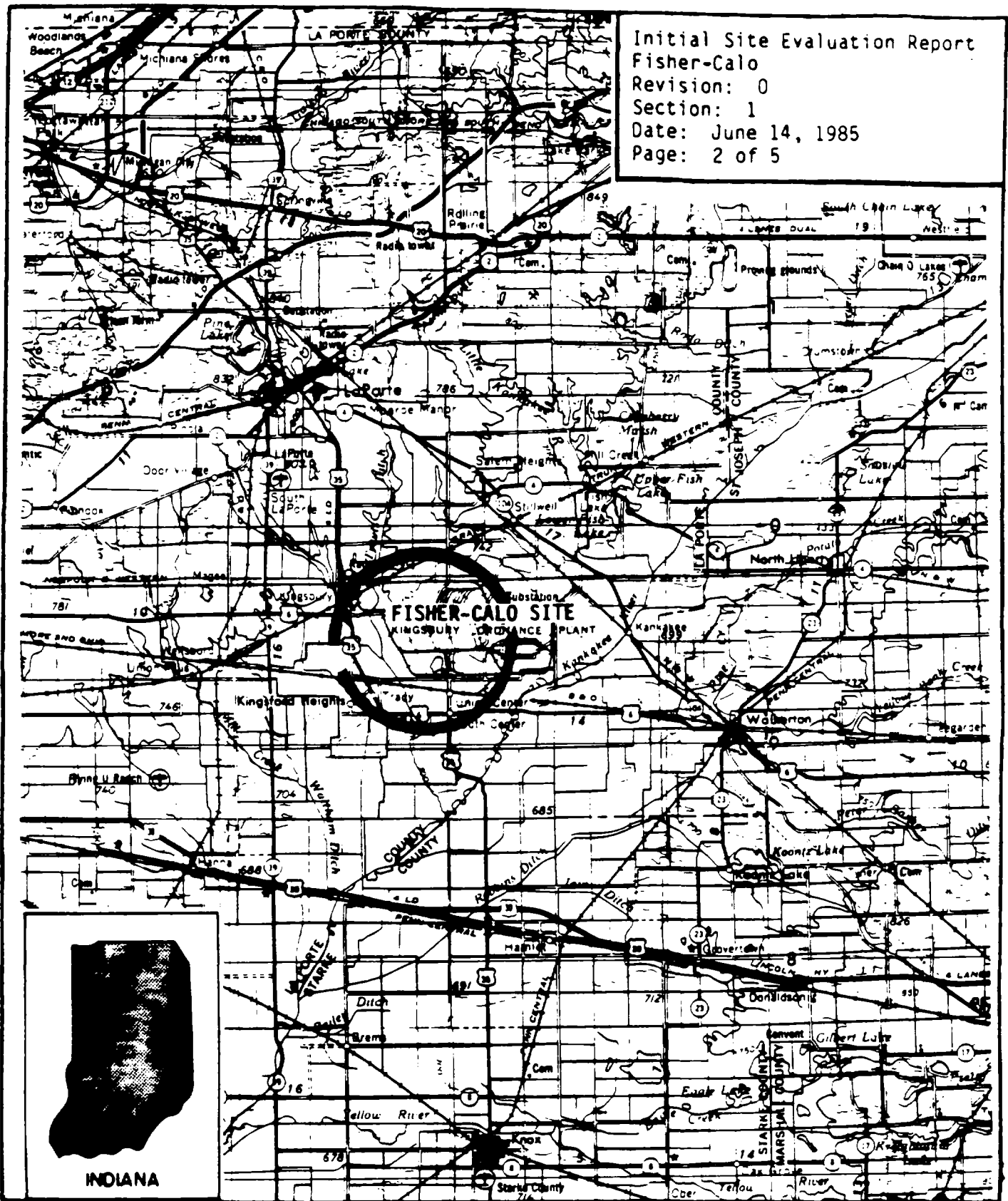
1.1 PURPOSE

This Initial Site Evaluation Report has been prepared to satisfy the requirements of the Work Plan Memorandum for the Fisher-Calo Chemical and Solvents Corporation site near Kingsbury, Indiana (Document No. 209-WP1-WM-BBQP-1) and the Work Assignment for this site (64-5L13.0). The purpose of this report is to summarize the existing conditions and background data for the site implementation of a Remedial Investigation/Feasibility Study (RI/FS) Program.

1.2 SITE LOCATION

Fisher-Calo Chemical and Solvents Corporation, hereafter referred to as Fisher-Calo (FCC), is located on two parcels of land in the Kingsbury Industrial Park in LaPorte County, Indiana. The Kingsbury Industrial Park was formally the U.S. Military's Kingsbury Ordnance Plant. The Fisher-Calo properties occupy approximately 250 acres, 240 acres at the main plant site along One (1) Line Road and 10 acres at the Two (2) Line Road site, in Section 5 and the SW quarter of Section 4 and the NW quarter of Section 9 and the NW quarter of the NE quarter of Section 8, Township 35N, Range 2W. The location of the site is shown in Figure 1-1 and 1-2. The communities of Kingsbury, 1.9 miles to the northwest, and Kingsford Heights, 1.6 miles to the southwest, are the major population centers located near the site.

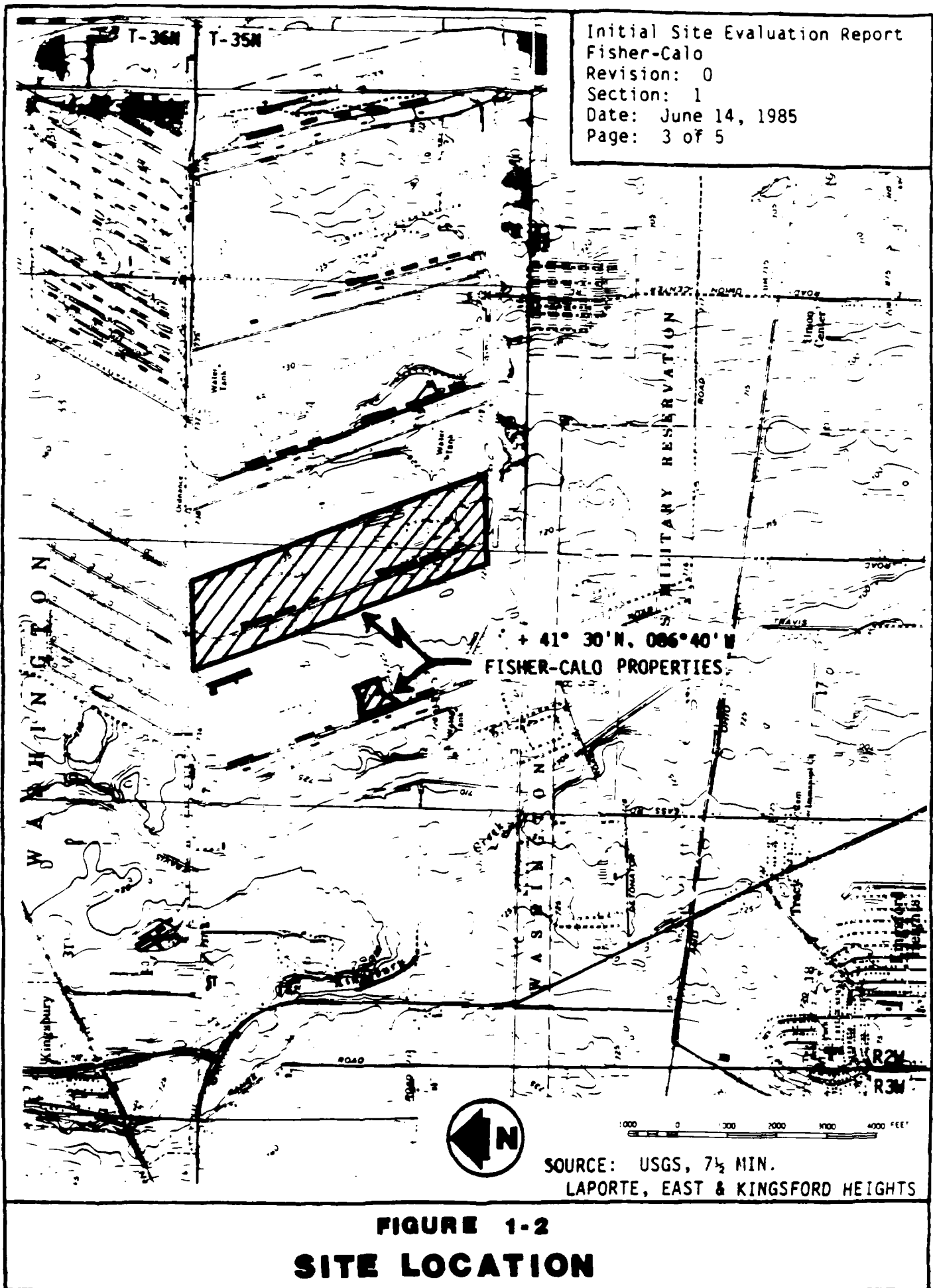
The owner of the property is David B. Fisher, President of Fisher-Calo. Mr. Fisher was also an officer of Midwest Chlorine Corporation, Midwest Ammonia Corporation, Wallace Warehouse, and Merchant's Leasing Corporation. The first three of these other corporations were also located in the Kingsbury Industrial Development. In August 1978, Fisher-Calo Chemical and Solvents Corporation, Midwest Ammonia



1 0 5 miles

SOURCE: USGS, 1:250,000 SCALE - CHICAGO 1970

FIGURE 1-1
AREA LOCATION



Corporation, Wallace Warehouse and Merchant's Leasing Corporation were merged as wholly owned subsidiaries of Fisher-Calo. Corporate offices of Fisher-Calo are located at 600 West 41st Street, Chicago, Illinois 60609.

Fisher-Calo has been primarily involved in the packaging, storing, and distribution of industrial chemicals as well as solvent reclamation of waste paint and metal finishing solvents. Midwest Chlorine and Midwest Ammonia, which also shared the One Line Site were involved in the production of sodium hypochlorite and the packaging of liquid chlorine, anhydrous ammonia, sulfur dioxide, anhydrous hydrogen chloride, and methyl chloride for sale to commercial users of these materials.

Prior to February 1985, Fisher-Calo divested itself of its wholly owned subsidiaries. In February 1985, Fisher-Calo filed for bankruptcy.

1.3 SITE STATUS AND PROJECT TYPE

Fisher-Calo is in Group 3 on the National Priorities List. The site is presently within the jurisdiction of the CERCLA enforcement group of Region V, USEPA, but it is anticipated that the site will become a fund-financed CERCLA site.

1.4 OVERVIEW

As a result of operations by Fisher-Calo Chemical and Solvents at its facility in the Kingsbury Industrial Park, near Kingsbury, Indiana, the underlying groundwater and soils have been contaminated with hazardous materials. Due to constraints imposed upon the USEPA, and its contractors, a full and detailed definition of the extent of this contamination of the environment has not been possible. As a result of the Consent Decree issued by the Northern District of Indiana Federal Court, quarterly analysis of selected monitoring wells at the Fisher-Calo

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facility has shown that all sources of contamination have not been removed from the site and that the groundwater underlying the site has not purged itself as was contended by Fisher-Calo and its representatives. The Fisher-Calo facility has and currently poses a potential threat to the health and safety of the surrounding population and represents a hazard to the environment.

The information as presented in the following sections summarizes conditions and the history of the site to-date in order to provide a base for preparation of the necessary Work Plans for conducting an RI/FS at the Fisher-Calo site.

2.0 SITE DESCRIPTION

2.1 REVIEW OF SITE SETTING

2.1.1 PHYSICAL CONDITIONS

The Fisher-Calo site is located within the Kingsbury Industrial Development Park along One-Line and Two-Line Roads (See Figure 1-2). Overall, the entire Industrial Development Park consists of about 6,000 acres with the industrial process facilities surrounded by grasslands, woods, and farmland. Since this was once a U.S. Military Ordnance Plant, the buildings were spaced apart intentionally. Fisher-Calo as well as other industries have modified as necessary and occupied these existing facilities.

The Fisher-Calo One-Line facility is bordered to the north and south by grasslands and other buildings. To the east and between the One Line facility and the Two Line facility, the adjoining fields are under cultivation. The area west of the One Line facility consists of scattered woodlands and fields with Travis Ditch about 1,500 feet west.

The Two-Line facility of Fisher-Calo is situated in surroundings similar to the One-Line facility and has adjacent buildings located to the South and to the Northwest.

The land west and east of the Two-Line facility, as well as along the eastern boundary and on the southern side of the Fisher-Calo property, is under cultivation. The area north of the Two-Line facility, and across Hupp Road (the main road in and out of the complex) was the site of munition bunkers and is basically grasslands with the aforementioned bunkers spaced throughout the area. To the south of the facility, the land consists of scattered woodlands and grasslands. At the southeast corner of the Two-Line Road facility, a wetland area exists. To the east at the end of Hupp Road and approximately 15,000 feet from the site is the Indiana Kingsbury Fish and Wildlife area.

The entire Kingsbury Industrial Development property is surrounded by a fence. In addition, each of the areas along the different roads, One-Line and Two-Line, are enclosed by fences. These fences enclose not only Fisher-Calo facilities, but other facilities within these areas as well. Access directly to the Fisher-Calo areas is obtained by calling the Fisher-Calo plant personnel who then open the gate nearest their facility. Access can be gained to the site, however, through other gates located around each of the site areas which are open and unmanned by the other industries located within each area.

2.1.2 GEOLOGICAL SETTING

The Fisher-Calo site is located on the Kankakee Outwash and Lacustrine Plain, an area of extensive glacial outwash and lake/river deposits laid down in a broad sandy plain during the Wisconsin glaciation approximately 12,000 years ago. The dominant soil type in the area is the Tracy sandy loam, a layer about 9 inches thick and with moderate hydraulic conductivities ranging from 4.3×10^{-4} to 1.4×10^{-3} cm/sec. The subsoil below this surface soil consists of about 52 inches of sandy loam and stratified gravelly sandy clay loam with similar moderate conductivities as the surface soils. Beneath the subsoil, the lower unconsolidated materials extend approximately 200 feet to the underlying Devonian-Mississippian Ellsworth Shale and Upper Devonian Antrim Shale bedrock.

The unconsolidated materials are divided into two major units. The upper unit averages approximately 70 feet in thickness. These materials consist of medium to coarse sand with some clay, silt, and pebbles. These materials have a moderate hydraulic conductivity of 4.3×10^{-3} to 1.4×10^{-2} cm/sec. The lower unit, above the bedrock, is about 130 feet thick and consists of a silty, sandy, pebbly clay till with a low hydraulic conductivity of 1.4×10^{-7} cm/sec.

2.1.3 TOPOGRAPHY AND CLIMATE

The Fisher-Calo site is located as shown in Figure 1-2. The landscape of

this area is flat lying with a one (1) percent slope. Generally, the slope of the land is to the west.

As a result of the flatness of the land as well as the permeable nature of the areas, soils infiltration is considered to be approximately one-third of the precipitation. With an annual precipitation of between 35 and 40 inches per year, approximately 12 inches of precipitation can be anticipated to infiltrate downward being incorporated into the area's groundwater system.

The available topographical maps of the site are the 7.5 minute series USGS quadrangle map for LaPorte East, Stillwell, Hamlet, and Kingsford Heights.

2.1.4 HYDROLOGY

With evapotranspiration, the flatness of the land and the high permeability of the soils in the area, runoff has been considered as minimal. What runoff does occur from the two facilities of Fisher-Calo would tend to follow one of two drainage patterns. Runoff from the eastern portions of Two-Line Road would flow towards a drainage ditch running in a north-south direction and located to the east of this facility. This drainage ditch ends in depressed areas located along the southeastern corner and south of the Two-Line facility. Runoff from the western portions of the Two-Line facility and the eastern portions of the One-Line facility would flow between these two facilities in a southern direction with discharge into a depressed area south of the site. Further to the west, approximately 1,500 feet and 2,500 feet from the One-Line facility, are Travis Ditch and Kingsbury Creek. These two waterways are the major surface water courses of the area, and combine approximately 2,500 feet south-southwest of the Fisher-Calo One-Line facility. The combined waterways, known as Kingsbury Creek, continue to flow to the south, eventually discharging into the Kankakee River. Travis Ditch is also the receiving stream for the LaPorte Wastewater Treatment Plant effluent (See Figure 1-2).

Groundwater in the area is located approximately 20 feet below ground level. From studies conducted by the Technical Assistance Team for the USEPA, a trend of the groundwater to flow in a southwesternly direction towards Travis Ditch and Kingsbury Creek. Whether the creek system acts as a natural point of discharge for the underlying groundwater, and, therefore, acts as a barrier was not verified in these studies.

To the northwest of the site, the city of Kingsbury utilizes wellwater for its water supply as do the villages of Tracy and Kingsford Heights which are located to the southwest of the site (See Figure 1-1). Inside the Kingsbury Industrial Development Park, a separate water distribution system exists. This system is currently being supplied through a separate well system. Currently, only one out of seven wells in the site area provides all the water needs of the complex.

Monitoring wells located at the Fisher-Calo facilities during the TAT investigation in 1982 have shown the underlying groundwater to be contaminated with chlorinated solvents. Additional testing of three of these monitoring wells from 1982 to the present has shown that this contamination still exists at the site. The potential sources of this contamination is from past spills, leaks, and buried wastes. At the present time, one suspected source of continuing contamination is in the older waste burial area located in the northeastern corner of the Two-Line facility.

2.1.5 SURFACE WATER BODIES

With the predominance of the flat poorly drained soils at the site, storm-

water accumulates in depressions around the site. These depressions act as natural recharge systems to the aquifer, allowing stormwater to collect and then percolate downward to the aquifer. Where runoff ditches do occur, they usually terminate in one of these depressed areas. At the facility, there is one such depressed area located to the northeast of the Fisher-Calo buildings. In the far southern end of the depression at

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Letter, T. W. Daggett, Region V Regional Counsel, U.S. EPA, from B. M. Possin, Environmental Investigations Group, November 6, 1984.

An Evaluation of Groundwater Contamination at the Fisher-Calo Chemicals and Solvents Corp. and Associated Properties Located Near Kingsbury, Indiana, prepared for Region V U.S. EPA under TDD# F5-8105-05, February 25, 1985.

U.S. v. Fisher-Calo Chemicals & Solvents Corp.; David B. Fisher,
U.S. District Court for Northern District of Indiana, South
Bend Division, Civil No. S 80-204
Verified Statement, Kenneth W. Pahs.
Verified Statement, Bruce Carlson.
Deposition, Joseph Cotton.
Affidavit, Francis J. Biros.
Affidavit, Dana Davoli.
Affidavit, Robert A. Griffin.
Affidavit, Eugene Meyer.
Affidavit, Ernest Glenn Swim.
Deposition, Ernest Glenn Swim
Deposition, David B. Fischer
Verified Statement, Paul Haman.

the Two-Line facility where the solid waste was disposed, a small body of water collects. These depressed areas are shown in Figure 1-2 and 3-1.

2.1.6 OTHER NOTABLE FEATURES

Figures 3-1 and 3-2 show the location of building and other structures at the site. As discussed in Section 2.4, aerial photography shows that spills or leaks from several sources were noted primarily in the area of drum and tank storage at the Fisher-Calo One-Line facility.

2.2 SITE HISTORY

Fisher-Calo is located in the Kingsbury Industrial Development Park, near Kingsbury, Indiana. In 1970, Midwest Chlorine Corporation began operations at the One-Line facility. At this time, the disposal of solid wastes and liquid wastes at and around the facility began. In 1972, Midwest Ammonia Corporation and Fisher-Calo Chemical and Solvents Incorporated began operations at the One-Line Facility. These three firms and a fourth, Wallace Warehouse, were merged as part of Fisher-Calo on August 31, 1978.

Throughout the history of these firms at the One-Line and later the Two-Line facilities, there have been numerous inspections of the operations by the State of Indiana, USEPA, and other regulatory agencies. These inspections have shown a pattern of poor waste as well as general chemical management at the facilities with spills, leaks, dumping, poor housekeeping, etc., numerous citations being issued by these regulatory agencies. In the years of operation at the site, several significant events occurred at or near the site as a result of Fisher-Calo's operations.

In September 1974, a fire occurred on property owned by Space Leasing, Inc. The source of this fire was buried drums of paint pigments and other wastes, disposed of at this location for FCC and used as fill material at Space Leasing. From all accounts, approximately 700 to 1,000

drums were buried at this site. The resulting fire was allowed to burn itself out since the local fire department could not bring it under control.

In March 1978, a more significant fire occurred at the north end of the Fisher-Calo One-Line facility. The source of this fire, as the previous one, was unknown. In this instance, in excess of 20,000 drums of waste, consisting primarily of still bottoms from the Solvent recovery distillation unit of the Fisher-Calo operation were destroyed by this fire. In the course of this fire, the smoke plume reached heights of over 8,000 feet and resulting in the evacuation of over 10,000 residents of the area. The resulting debris from this fire was not cleaned up for over a year. When clean-up did occur, Fisher-Calo was required to remove the debris and the top 6 inches of soil from the burn area.

In June 1979, the Indiana State Board of Health excavated buried drums from a location in the northeast corner of the Fisher-Calo Two-Line facility. During these activities, other potential burial and waste disposal areas were identified. In July 1980, the USEPA filed suit under Section 7003 of RCRA to eliminate the hazards posed by the previous activities at the Fisher-Calo sites.

In August 1981, the USEPA Technical Assistance Team (TAT) Contractor conducted a sampling program which showed the groundwater at the Two-Line and One-Line facilities to be contaminated with organics and indicated a high potential for a continuing source of organic contamination from the previously excavated area located in the northeast corner of the Two-Line facility. The study also gave evidence that the surface soils in these areas have been contaminated by heavy metals as a result of past activities at the facilities.

From this source, there is a plume of contamination extending to the southwest through the One-Line facility. Additional sampling was recommended to define this source as well as the potential for further migration to the southwest of the contaminant.

In August 1984, the USEPA and Fisher-Calo entered into a Consent Decree. This Consent Decree required Fisher-Calo to monitor on a quarterly basis three (3) selected monitoring wells to determine if the contaminants would decrease in concentration with time. Following several years of monitoring, it became apparent that the contaminant levels had not decreased in the selected monitoring wells. In April 1985, the USEPA issued a Work Assignment to the REM II Contractor, CDM, to conduct and perform Remedial Investigation/Feasibility Study at the Fisher-Calo site.

2.3 CHRONOLOGY OF EVENTS

- August 1, 1963 - Kingsbury Industrial and Development Corporation (KID) acquires the property of the Kingsbury Ordnance Plant, Kingsbury Industrial Development Park.
- 1970 - Midwest Chlorine Corporation begins operation at the One-Line facility at KID.
- April 23, 1971 - David B. Fischer purchases the land at the One-Line facility from KID, on which Midwest Chlorine Corporation is operating.
- 1971 - Miscellaneous solid waste and still bottoms from the LUWA distillation unit are dumped in a pit to the south of the One-Line facility.
- 1972 - Midwest Ammonia Corporation begins operation at the One-Line facility.
- Fisher-Calo Chemical & Solvents Incorporated begins operation at the One-Line facility.
- Sept. 26, 1974 - Drums used as fill material from Midwest Chlorine at Space Leasing Corporation catch fire. The material is allowed to burn itself out. It was reported that 700

to 1,000 drums were located at this site. A truck with drums on it was also consumed in this fire, for which no source was determined.

Oct. 11, 1987 - Olin Corporation sells the property which makes up the Two-Line facility to David B. Fisher.

March 23, 1976 - The State of Indiana issued Fisher-Calo Chemicals a permit to haul liquid industrial wastes.

1977 - Continued inspections show that cyanide wastes are still not properly being stored. Fisher-Calo proposes using underground bunker at Two-Line facility as storage area.

- Inspections continue at Fisher-Calo. Cyanide storage issue still not resolved. An incinerator has been constructed at the One-Line facility.

Feb. 21, 1978 - Indiana State Stream Pollution Control Board issues an Order Agreement requiring that Fisher-Calo: 1) store cyanide wastes in a bunker; 2) store acid wastes in a separate bunker; 3) submit a design for acid neutralization and cyanide destruction facilities; and, to the State of Indiana; 4) no new cyanide wastes be accepted until said treatment facility is operational. Several other issues were also addressed, and a \$1,500 fine was levied.

March 1978 - Drums of waste are now reported being stored at the Two-Line facility.

March 31, 1978 - A fire of unknown origin erupts among the 55-gallon barrels located north of the One-Line Fisher-Calo building. As a result of this fire, more than 20,000

drums of waste still bottoms and other wastes are destroyed. The resulting plume of smoke rises 8,000 feet into the air, and about 10,000 residents in and around the site are evacuated.

- April-May 1978 - Several inspections of the Fisher-Calo facility are made by the LaPorte County Health Department and State agencies. The cyanide storage problem as well as acid disposal has yet to be addressed. Clean-up of the fire area has not been undertaken yet.
- July 1978 - In a series of correspondences with the Indiana State Board of Health, Fisher-Calo indicates that it has revised its plans for the site. Fisher-Calo proposes to dispose of the cyanide wastes at an off-site facility, dispose of the burned out drums from the fire, and begin clean-up of the area. Fisher-Calo also proposes locating the solvent recovery system (LUNA) at the Two-Line facility.
- August 16, 1978 - Inspection by the Indiana State Board of Health indicates that some clean-up of the fire area debris has begun. Cyanide and acid waste storage is still not in compliance. Improper storage has been found at the One-Line, Two-Line, and Wallace Warehouse facilities.
- August 31, 1978 - Midwest Ammonia Corporation, Wallace Warehouse, and Merchants Leasing Corporation are merged into Fisher-Calo Chemical and Solvents. David B. Fisher is an officer of all of these firms.
- Dec. 31, 1978 - USEPA conducts first extensive soil sampling of the site. Six soil samples and two water samples from standing water at the Fisher-Calo property were

obtained. One water sample was also obtained from a 6 inch steel cased well. The soil samples showed toxic concentrations of chromium, cadmium, lead, copper, cyanide, phenolics, arsenic, and some substituted benzene compounds. The water samples showed contaminant levels greater than the 1975 USEPA Primary Drinking Water Standards for lead, phenolics, chromium and selenium.

not regulated
in drinking water

- May 1979 - Stream Pollution Control Board of the State of Indiana files for an injunction in the LaPorte Circuit Court to require Fisher-Calo to comply with the agreement order of February 21, 1978.
- June 1979 - LaPorte County Health Department begins excavation of buried drums at the Two-Line facility. Removal of the fire debris at the One-Line facility continues. Representative samples of the excavated drums at the Two-Line facility reveal high concentration of cadmium, chromium, copper, lead, nickel, and zinc.
- Oct. 18, 1979 - Indiana State Board of Health inspects the Fisher-Calo site. This inspection reveals that cyanide drums are again being placed outside of the bunkers. New wastes have been brought into the site since the March 1978 fire. Samples are taken of some of the cyanide waste containing drums. Surface soils contaminant levels of 1,000 to 60,000 mg/kg are found.
- 1980 - Several inspections are conducted by the various regulatory agencies, including inspections on April 22 and May 2, 1980, by HWI Section of S&A Division - Region V EPA. Soil and water samples were collected at this time.

- July 3, 1980 - Section 7003 of RCRA, ^{order of} (injunctive relief to eliminate an imminent and substantial endangerment to health and the environment arising from the handling, storage and/or the disposal of hazardous chemical wastes) at the Fisher-Calo facility in the U.S. District of Indiana.
- Nov. 14, 1980 - Fisher-Calo applies for a permit for Interim Status under RCRA, Part A.
- Jan. 16, 1981 - Fisher-Calo is issued a Liquid Industrial Waste Hauler Permit for 1981. ^{by whom: EPA State!}
- March 4, 1981 - USEPA conducts a RCRA - Interim Status Inspection of the Fisher-Calo Facility.
- June 17, 1981 - USEPA Region V rejects modification of the Fisher-Calo Part A RCRA permit to allow for storage of cyanide wastes transported to another site near Bicknell, Indiana, by Fisher-Calo. Conditions preclude storage at this site; Fisher-Calo required to move these materials elsewhere.
- June 27, 1981 - USEPA granted access to Fisher-Calo and Kingsbury Industrial and Development Corporation (KID) property for purposes of sampling and installing monitoring wells.
- Sep. 3, 1981 - U.S. District Court reverses June 27, 1981, decisions and only allows access to KID during daylight hours. At conclusion of 120 days from the date of this order, all wells installed and holes drilled are to be removed and sealed.
- Aug-Sept. 1981 - The Technical Assistance Team (TAT), under its

contract with the USEPA, conducts a soil sampling and monitoring well installation program at Fisher-Calo.

- 1982 - Solvent Reclamation System installed at Two-Line facility.
- Feb. 25, 1982 - The TAT issues its report "An Evaluation of Groundwater Contamination at the Fisher-Calo Chemical and Solvents Corporation and associated Properties located near Kingsbury, Indiana". The results of this study show high levels of some metals in the soils sampled. Organic contamination is present at the Two-Line and One-Line facilities, but apparently, not in the alleged dump areas south of the One-Line facility. A plume from the Two-Line facility through the One-Line facility apparently exists. More definition of the size of this plume is necessary to determine its impact. Groundwater flow is to the southwest towards Kingsbury Creek--Travis Ditch which may act as a barrier for further migration of contaminants off-site. Further definition of the groundwater patterns is necessary to assure that no potential for contamination of wells further to the south and west exists.
- August 4, 1982 - Fisher-Calo and the USEPA enter into a Consent Decree. The Consent Decree requires Fisher-Calo to sample three monitoring wells quarterly to verify the premise that all buried sources of contamination have been removed, and that due to the high flow rate of the groundwater underlying the site, the groundwater will naturally purge itself.
- Oct. 12, 1984 - Quarterly sampling by Fisher-Calo indicates that the concentrations organic contaminants being monitored to

- Sept. 14, 1984 are not decreasing at the wells sampled. This indicates in all likelihood that a continuing source of contamination still exists at the Fisher-Calo site.
- Sep. 20, 1984 - Indiana State Board of Health requests a Remedial Investigation/Feasibility Study be conducted at the Fisher-Calo facility under the CERCLA (Superfund) Program.
- Feb. 1985 - Fisher-Calo files for bankruptcy.
- April 10, 1985 - The USEPA authorizes the REM II contractor, Camp Dresser & McKee, to prepare a Work Plan and associated documents for conducting an RI/FS at the Fisher-Calo facility.
- April 1985 - The USEPA-EMSL in Las Vegas completes and submits a Time Sequence Aerial Photographic Report for the Fisher-Calo site.

2.4 TIME SEQUENCE PHOTOGRAPHS

A Time Sequence Aerial Photographic Report of the Fisher-Calo site was completed in April 1985 by the USEPA Environmental Monitoring Systems Laboratory in Las Vegas for the Environmental Services Division of Region V and the Office of Emergency and Remedial Response in Washington, D.C. The study spans a 14-year period (photographs in 1970, 1973, 1980, and 1984). From this aerial analysis, the visual historical development of the site is provided. A brief summary of this analysis follows:

- May 26, 1970 - The area is still the Kingsbury Ordnance Plant. There is a small lagoon located along the One-Line Road site, but south of the area later referred to as the Fisher-Calo site. Another lagoon is located in the northeast corner of the Two-Line Road site.

March 22, 1973 - Evidence of chemical processing activities at the Fisher-Calo One-Line Road facility is apparent; tanks and drums appear at the site. Small amounts of solid waste are also visible in two pits located east-southeast of the Fisher-Calo facility. There are also signs of staining at several locations in and adjacent to the Fisher-Calo facility.

At the Two-Line site, a large excavation in the southeast corner of the area is being used for disposal of solid waste.

Immediately across from the northwestern corner of the site, the land is being excavated and graded for construction of a new plant.

April 22, 1980 - There has been a significant increase in the number of drums stored at the One-Line site. North-northeast of the main building there is an area where the soil appears to have been graded. A new lagoon has also appeared at the southeast corners of the Fisher-Calo process building. Solid waste has been disposed of in a drainage ditch located southeast of the Fisher-Calo site. Evidence of staining in the site area is still apparent.

At the Two-Line site, a new waste disposal area is seen in the Northeast corner, and storage tanks appear at the southern end. A new industrial plant is located northwest of the Two-Line site.

June 11, 1984 - At the One-Line Road facility, the number of drums stored at the site has decreased. Leakage is evident at the processing tanks. The solid waste disposal area in the drainage ditch to the east of the

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Fisher-Calo property does not appear to have changed since 1980.

At the Two-Line facility, activity seems to have increased greatly since 1980. Numerous vertical storage tanks have been constructed at the northern chemical processing building. In addition, a large number of drums are located in several groups in this area. Staining appears in the northwest corner of the facility. There also appears to have been more activity with respect to the disposal of solid waste in the depression located in the southeastern portion of the facility.

3.0 CONTAMINATION PROBLEM DEFINITION

3.1 WASTE DISPOSED OF AT SITE

The Fisher-Calo facility was primarily engaged in the reclamation of spent solvent. Therefore, the bulk of hazardous wastes received at their facility near Kingsbury, Indiana consisted of various spent solvents. From transporter records for Fisher-Calo, it can be seen that the paint solvents made up the majority of these spent solvents. Other solvents as received at Fisher-Calo included:

- o 1,1,1-Trichloroethane
- o Acetone
- o Methylene Chloride
- o Trichloroethylene
- o Other Waste Solvents

In addition, other wastes such as metal treating, cyanide containing, and caustic and acidic wastes were received at the Fisher-Calo facility. Many of the solvent type wastes were reclaimed by use of a thin film evaporator, LUWA, while others were stored at the site. Caustic and acidic wastes were dumped on the ground initially; later they were neutralized and discharged into the industrial complex sewers. Cyanide wastes were stored at the site until finally disposed of at other facilities in the early 1980's. Primary constituents of the metal treating wastes included heavy metals such as chromium, nickel, lead, copper, zinc, and cadmium and also included arsenic and cyanide. Organic constituents of these wastes included toluene, phenolics, tetrachloroethylene, 1,1-dichloroethane, benzene, 1,1,1-trichloroethane, as well as other organics commonly found in paint wastes and organic solvents used by industry. As part of their operations, Fisher-Calo produced a still bottom waste which they accumulated in 55 gallon drums until the March 1978 fire destroyed the majority of these containers.

From previous investigations conducted at the Fisher-Calo facility, it was determined that these wastes were stored, buried, dumped, spilled, or otherwise handled at various locations at the One-Line and Two-Line facilities. In the course of its operations, approximately 700 to over 1,000 drums were recieved per month at these facilities. Of these, less than 1 percent were cyanide containing drums. An exact number and quantity of wastes as delivered, processed and/or disposed of at the facility is not possible. Areas of known or suspected disposal by dumping and/or burial are shown in Figure 3-1.

3.2 DEGREE OF SITE CONTAMINATION

From the previous studies conducted at the Fisher-Calo site, it has been determined that high levels of some heavy metals, including beryllium, are present in the soils and groundwater. For the most part, these heavy metals are not very mobile; they remain in the soil matrix unless environmental conditions are present in the soils in which they may go into solution. These contaminants, therefore, tend to remain where they occur or are distributed by conditions such as stormwater runoff or windborne dispersion of the solid particles.

In the course of the operations at Fisher-Calo, unknown quantities of organic contaminants have been discharged into the environment at the site, or more specifically, into the groundwater aquifer underlying the site. From the various sampling programs performed at the facility, the highest concentrations found in the groundwater were downgradient from the area at the Two-Line facility where the drums were excavated and further downgradient from the center of the One-Line facility. Based upon the data collected from this sampling program, the Consent Decree of 1982 required Fisher-Calo to continue sampling three selected wells to monitor any change in conditions in the groundwater. Table 3-1 presents a summary of the results from the initial TAT and following sampling locations as shown in Figure 3-2.

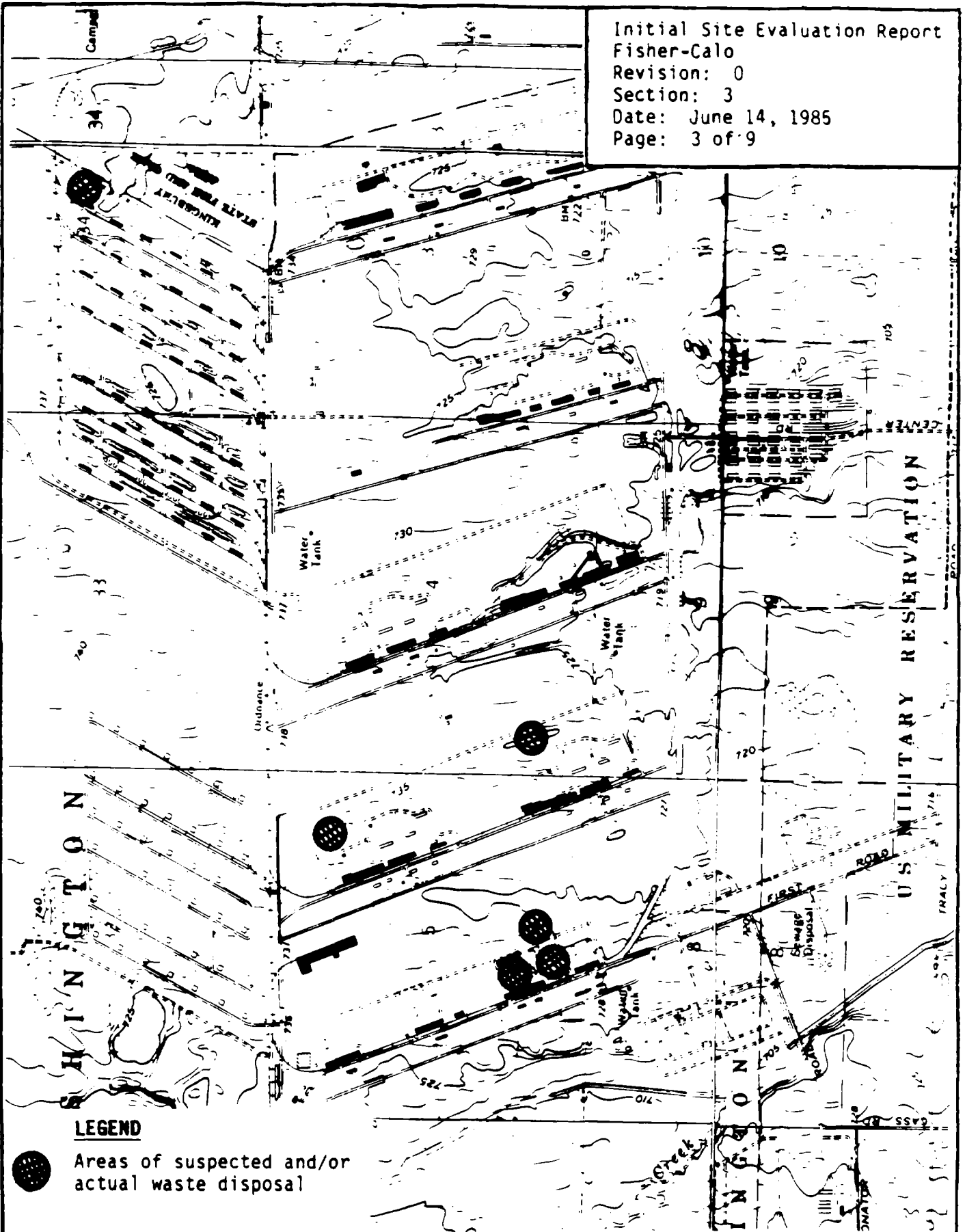


FIGURE 3-1
LOCATION OF DISPOSAL AREAS

TABLE 3-1 - Monitoring Well Analytical Results (ug/l)

Sampling Date	1,1, Dichloroethylene			Trichloroethylene			Tetrachloroethylene		
	83	10	19	83	10	19	83	10	19
09-81 (1)	4.3	5.6	330.	340.	390.	3900.	9.1		2300
10-12-82 (2)	5.4	8.5	250.	3420.	415.	6300.	2.7	5.7	1080
11-19-82 (2)	4.9	4.0	260.	5275.	500.	15300.	7.4	14.6	1680
03-02-83 (2)	13.9	8.5	160.	5090.	710.	9800.	15.1	34.5	1600
06-07-83 (2)	6.5	4.9	185.	3980.	420.	8300.	14.0	20.0	1445
07-13-83 (2)	5.6	5.0	157.	4790.	332.	8050.	22.0	21.0	1390
11-22-83 (2)	6.4	10.8	163.	4870.	382.	8980.	18.9	20.6	1660.
05-03-84 (2)	5.2	30.0	198.	3400.	845.	9520.	17.0	19.0	1490.
09-14-84 (2)	6.9	4.8	215.	3980.	318.	8203.	24.0	13.0	1800.
Proposed RPDWR MCL	7.0			5.			10.0		
USEPA CAG 10 ⁻⁶ cancer risk level	0.23			2.8			1.0		

Source: (1) TAT Evaluation Report of February 25, 1982.
 (2) EIS Environmental Engineers, Inc., from quarterly analysis for Fisher-Calo.

Note: The highest organic contaminant found by the TAT investigation was 1,1,1-Trichloroethar at 10,000 ppb in Well 19. The proposed PDWS MCL is 200 ppb.
 U.S. EPA CAG 10⁻⁶ cancer risk level is 21.7 ug/l.

RPDWR MCL: Revised Primary Drinking Water Regulations--Maximum Contaminant Levels.

LEGEND

- Monitoring wells installed
- ⊙ Monitoring wells still in existence
- ✕ Soil sampling locations

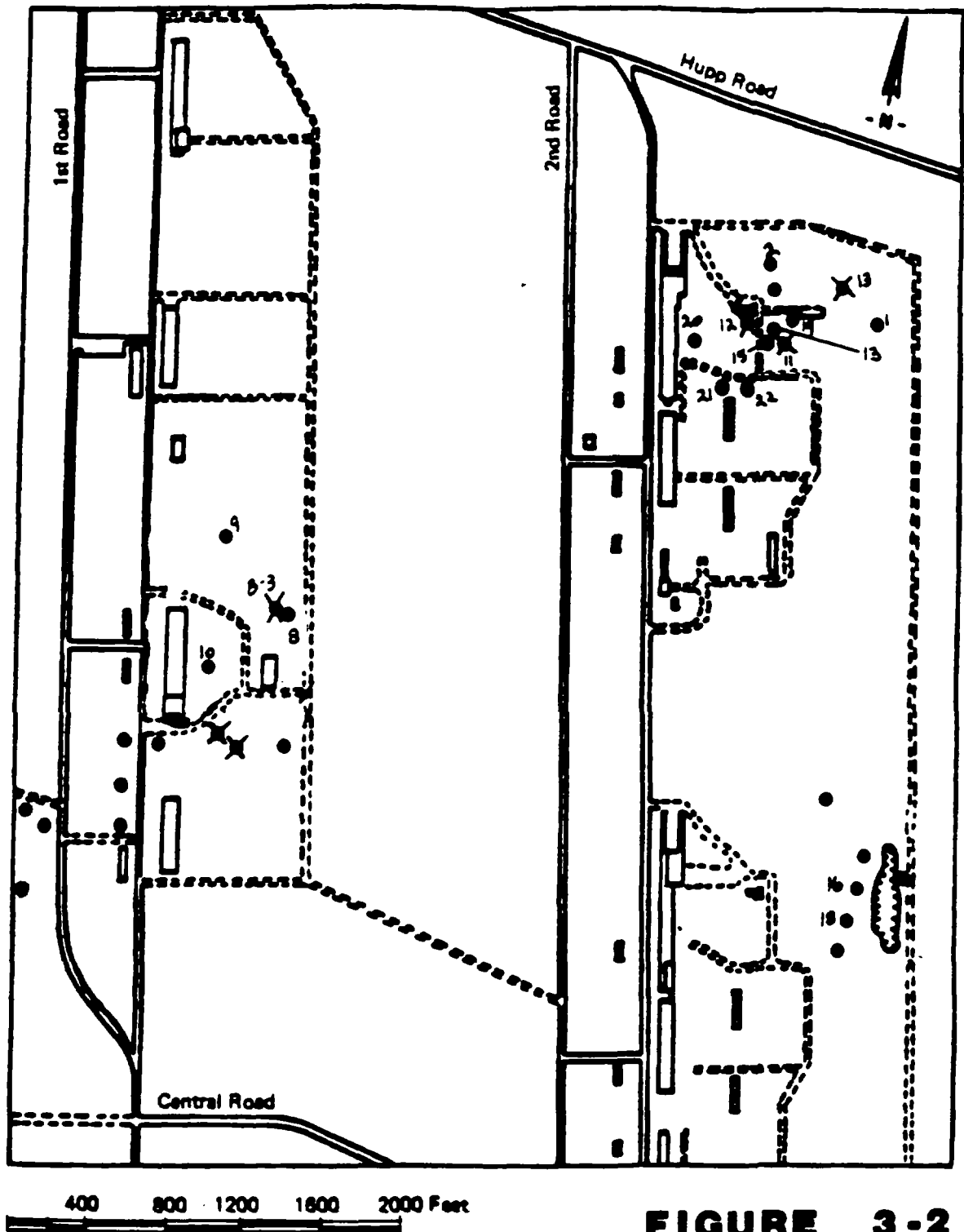


FIGURE 3-2

**TAT STUDY SAMPLING AND
 MONITORING LOCATIONS**

It is apparent from this data that there is a continuing source of contamination to the groundwater located at the Two-Line facility and possibly at the One-Line facility.

3.3 HAZARDS OF CONTAMINANTS

The following summaries present the hazards associated with each of the major contaminants found in previous sampling.

3.3.1 CYANIDE

Cyanide is classified as a poison. Under certain conditions, it can form hydrocyanic acid (hydrogen cyanide) which is a highly toxic, flammable gas. The primary routes of human exposure are inhalation, ingestion, and eye and/or skin contact. Generally, cyanide is fairly insoluble and has minimal potential to migrate into the underlying water table. However, due to its high toxicity, low levels are considered harmful to the environment. Some of the more significant criteria are:

WQC for Human Health = 0.200 mg/l

~~PDWR = 0.05 mg/l~~ Delete; not regulated in DW.

WQC for freshwater aquatic = 0.44 mg/l

IDLH for HCN = 50 ppm

3.3.2 BERYLLIUM

Beryllium is a known carcinogen with the primary route of exposure being inhalation, and skin and/or eye contact. Beryllium is also slightly soluble in water and dilute acids and bases. Established standards are:

WQC for freshwater fish = 0.13 mg/l

NIOSH 8 hour TWA = 0.002 mgBe/m³

3.3.3 CHROMIUM

Hexavalent chromium compounds are carcinogenic when inhaled. They are also toxic to humans; routes of exposure include ingestion and eye or skin contact.

~~Max~~
PDWR = 0.05 mg/l Maximum Contaminant Level (MCL)
WQC for freshwater fish = 0.1 mg/l
IDLH = Chromic acid - 30 mg/m³
 Chromium Metal & Salts - 500 mg/m³
 Soluble Chromic &
 Chromous Salts - 250 mg/m³

Solubility varies from insoluble to soluble depending on the compound and its form. Some compounds are corrosive. Standards are:

3.3.4 LEAD

Lead and its lead salts are fairly insoluble; potential for migration through the groundwater is minimal. The routes of exposure from lead are primarily inhalation, ingestion, and skin and/or eye contact. Lead poisoning in humans affects the nervous system, kidney functions, and red blood cell production, and may result in death. Applicable standards are:

PDWR = 0.05 mg/l MCL
STEL = 0.5 mg/m³

3.3.5 NICKEL

In some of its forms, nickel may be carcinogenic. Inhalation and skin/eye contact are the primary routes of exposure. Nickel can form a soluble salt which may migrate from its point of contamination through

the water system. Standards as applicable for nickel are:

$$\text{STEL} = 0.03 \text{ mg/m}^3$$

$$\text{WQC for freshwater fish} = e [0.75 \text{ hardness} + 1.06]$$

Since nickel rarely appears in drinking water, except in very low concentrations, and naturally occurring nickel forms insoluble salts, which precipitate to the bottom of bodies of water, no PDWR or SDWR have been established.

3.3.6 PHENOLICS

Exposure to phenolic compounds can result in burns, kidney damages, and death as well as promoting the development of cancer. Routes of exposure are: inhalation, ingestion, absorption, contact with eyes and/or skin. Phenolic compounds are slightly water soluble. Standards applicable for Phenols are:

$$\text{IDLH} = 100 \text{ mg/l}$$

$$\text{STEL} = 38 \text{ mg/m}^3$$

3.3.7 DICHLOROETHYLENE

*specify 1,1
cis 1,2
trans 1,2*

Dichloroethylene is one of the least toxic of the chlorinated ethenes, but is still considered as a carcinogen. The primary route of exposure is through inhalation. In an area such as the Fisher-Calo site, any spillage, leakage, or dumpage of this material in or on the soil presents a high potential for the vertical and horizontal migration of this contaminant towards and through the underlying soils to groundwater. Applicable standards are:

$$\text{STEL} = 20 \text{ ppm (80 mg/m}^3\text{)}$$

$$\text{WQS for freshwater aquatic} = 11.6 \text{ mg/l}$$

$$\text{PDWR (proposed)} = 0.007 \text{ mg/l}$$

$$\text{U.S. EPA CAG } 1 \times 10^{-6} \text{ cancer risk level} = 0.23 \text{ ug/d for 1,1}$$

3.3.8 TETRACHLOROETHYLENE

Tetrachloroethylene is carcinogenic and is linked to kidney and liver toxicity, as well as central nervous system effects. The routes of exposure for this compound are through inhalation, ingestion, absorption, and eye and/or skin contact. Spills and/or the dumping of this material at the site have created the potential for migration of this material vertically and horizontally in the underlying soil and groundwater. Applicable standards are:

IDLH = 500 ppm

WQS for freshwater aquatic life = 5.28 mg/l on an acute
toxicity basis and 0.84 mg/l
on a chronic toxicity basis

~~PDWH (proposed) = 0.010 mg/l~~

PEL = 100 ppm. for 8 hr. TWA

U.S. EPA CAG 1×10^{-6} cancer risk level = 1.0 ug/l

3.3.9 TRICHLOROETHYLENE (TCE)

TCE is classified as a carcinogen. It is readily absorbed into the bloodstream when ingested and appears to have some bioaccumulation tendencies. The primary routes of exposure are inhalation, ingestion, absorption, and eye and/or skin contact. Acute and chronic exposure at high dosages of TCE has resulted in liver toxicity and kidney damage. TCE migrates through the underlying soils and groundwater. The applicable standards are:

IDLH = 1,000 ppm

STEL = 150 ppm

PEL = 100 ppm 8 hr. TWA

WQS for freshwater aquatic life = 45 mg/l on an acute
toxicity basis

~~PDWH (proposed) = 0.005 mg/l~~

U.S. EPA CAG 1×10^{-6} cancer risk level = 2.8 ug/l

4.0 CONTAMINANT MIGRATION PATHWAY CONCEPTUAL MODEL

4.1 MIGRATION PATHWAYS

The primary pathway for migration of contaminants at the Fisher-Calo facilities is through the groundwater with secondary pathways of air and other sectors. A plume of organic contamination has been tentatively identified from previous sampling programs as emanating from the northeast corner of the Two-Line facility and under the One-Line facility. At this time, the assumption has been made that between Kingsbury Creek and Travis Ditch are the discharge areas of the groundwater system and that the contaminants are intercepted and cannot migrate further off-site. However, the monitoring wells were installed in the upper part of the aquifer (20 to 30 feet) and some of the contaminants may be in the lower part of the aquifer (and not showing up in the sampling programs). The plume of contaminants may extend beyond the creek systems. In the case of heavier organics, such as these under study, the tendency is to move downward quickly, especially in dry sands. This movement downward will also coincide with the horizontal dispersion of the contaminant plume. Because of the number and wide distribution of wells in the area and the possibility that the contaminant plume will pass beneath the creek systems to the outlying residential wells.

To some extent, the movement of the inorganic contaminants from the site would be by airborne dispersion of dust particulates and/or movement from the site of contaminated soils by other vectors, such as vehicles. The threat of the airborne dispersion appears to be a pathway only in those areas of the facilities where the soils would be disturbed by the activities at the site. Another vector of migration would be by transport of contaminated soils from the site on vehicles and personnel moving through contaminated areas.

Due to the permeability of the soils and flatness of the land, the site surface runoff does not appear to be a likely pathway for migration.

4.2 POTENTIAL RECEPTORS

Since the facility is located in a widely spaced industrial area, the greatest impact upon potential receptors is by movement of the groundwater towards the receptors located beyond the site through the wastes and contaminated soils.

With respect to groundwater, the nearest well in use is the Kingsbury Utilities Well No. 5 which is used to supply the needs of the Industrial Park. This well is located approximately 0.5 miles north-northwest of the One-Line facility. Assuming that the pumpage rate of the well does not significantly influence the Potentiometric surface, this well can be considered as outside the area of influence from contamination at Fisher-Calo. The nearest residential well is located 1.5 miles southwest of Fisher-Calo and beyond the intervening creek systems. In the event that the creek systems act as a natural barrier to the flow of contaminants from the site, then these wells would not be receptors. If the creek system does not act as a barrier, then the potential for future contamination of these wells would be a possibility.

With respect to the creek system itself, migration of contaminants into this system has not been verified. The organics contaminating the site would tend to volatilize into the atmosphere upon entry into the creek system and the inorganic metals discussed previously would not be expected to readily migrate towards this system. What contaminants may have migrated to the system apparently had little effect since past sampling has shown no influence. Furthermore, the Travis Ditch is a receptor for the treated wastewater from the City of LaPorte located upstream of the site which may have impacted and could interfere with future sampling due to the potential for organics and interferences as a result of this discharge.

To date, there have been no documented health effects as a result of Fisher-Calo's operations at the site. In the event it is determined that there are contaminants moving westward below the creek system, then the

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contaminants from Fisher-Calo could result in contamination of the wells in Kingsford Heights, and any private wells located in the trailer park located in the southwest corner of the KID property, north of Tracy. These affected areas are located approximately 1.5 miles to the southwest of Fisher-Calo.

In the event that the contaminants from Fisher-Calo were to reach these wells, the known carcinogenic effects of these contaminants could constitute a substantial threat to the public health of these communities and residences.

5.0 DATA REQUIREMENTS

From the data collected by the various regulatory agencies and their contractors, it is apparent that elevated levels of chlorinated organics do exist in the groundwater system as a result of Fisher-Calo's activities. It is also apparent that areas potentially exist in which elevated levels of heavy metals and cyanide are present in the surface and near-surface soils. From the TAT study, there appears to be a source of contamination at the Two-Line facility from an identified magnetic anomaly at this location. From the data as collected, a plume appears to extend southwest from this source. The width of this plume, as well as its extent, has been approximated based primarily upon the data from three monitoring wells.

A more concise definition as to the source of the magnetic anomaly and the apparent resultant downgradient contamination is required. It is also necessary to define the extent of the contaminant plume, i.e., does this source constitute the only source of contamination at the Two-Line facility and the downgradient One-Line facility or does another source of contamination exist at the One-Line facility.

The direction of groundwater flow of the site and surrounding area needs to be more fully defined. From the TAT study and other information, the groundwater flows generally in a southwest direction towards the creek system. However, due to constraints placed upon the USEPA and its contractors, a better definition of the interrelationship of the groundwater aquifer and the creek system was not possible. It is necessary to define this relationship more accurately to ascertain if the creek system acts as a barrier to the migration of contaminants towards the communities located downgradient and on the other side of the creek system. This will require the installation of monitoring wells on both sides of this system at the shallower depths as installed by TAT and at the deeper depths along the interface of the sand and underlying glacial till which is acting as an aquitard.

Again, due to the limitations imposed upon the EPA during previous studies, additional soil sampling of those areas not sampled previously such as the waste disposal area to the southeast of the One-Line facility on KID's property is necessary to determine the full extent of contamination at the site.

With the use by Fisher-Calo of many areas along the Two-Line and One-Line facilities for the storage and disposal of wastes as well as areas outside of these facilities and the apparent lack of definition of conditions in these areas, additional, data needs to be gathered. Are there still wastes deposited in the ground at Space Leasing, northeast of the Two-Line facility, which are contaminating the underlying groundwater. Have the previous activities of storage of cyanide and solvent wastes in the buildings located on the south side of the Two-Line facility resulted in contamination of the soils and groundwater.

In addition, definition of the contents of existing containers of wastes at the site is necessary such as the waste solvent storage tanks, the buried still bottom storage tanks, various drums and other containers located at the Two-Line facility.

The condition of and contents of the materials located in the Wallace Warehouse needs to be determined to define whether this area has become a source of contamination as a result of the long storage time involved.

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